Fun4All Calorimeter Plots – Energy recalibration

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Details:

- Particle: pi-
- Statistics: 100000 (0-30 GeV) + 50000 (0-10 GeV)
- geta range: -4 to 4
- Cuts employed:
  - **Tower energy cut: 100 MeV**
  - Detector-wise geta cuts
  - Circular cuts on dphi and dtheta: for manual clustering
- Photon digitization: turned off
- **Sampling fractions updated for all calorimeters**

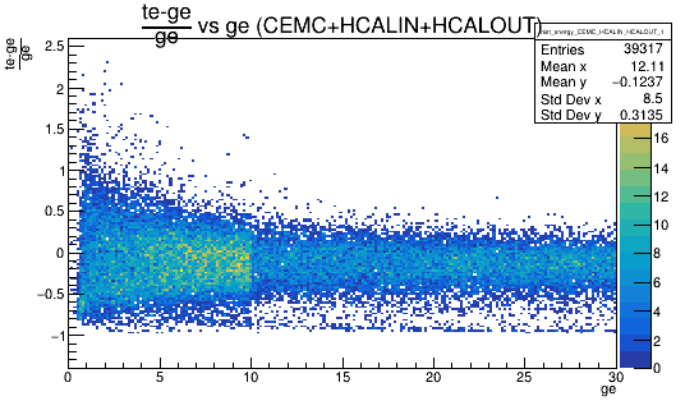
Pion

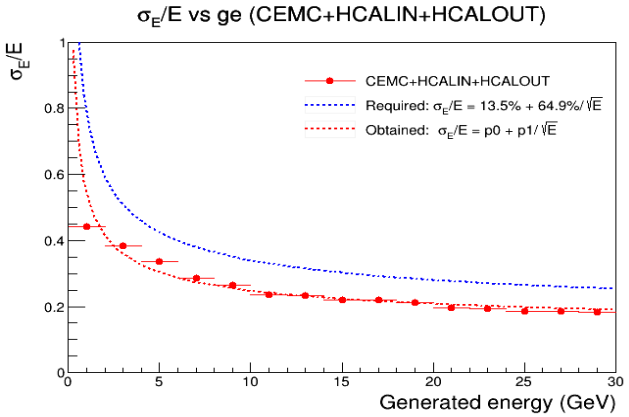
CEMC+HCALIN+HCALOUT
FEMC+FHCAL

Normalization procedure:
1. Make Tprofile plots for the individual calorimeter's te/ge vs ge plot.
2. Fit it with a function and normalize this function.
3. Multiply this normalized function with the tower energy of the respective calorimeter.
4. Look at the summed tower energy (te-ge)/ge plot (i.e. CEMC+HCALIN+HCALOUT & FEMC+FHCAL) and fit it with a function.
5. Use this function to recalibrate te(CEMC+HCAL) and te(FEMC+FHCAL).

Before recalibration: CEMC+HCALIN+HCALOUT

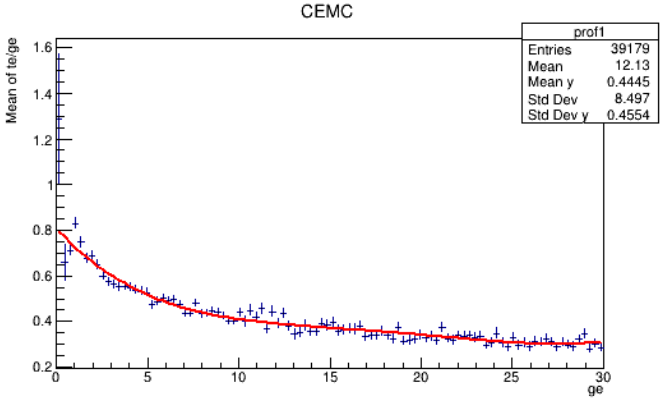
η = -1.1 to 1.1



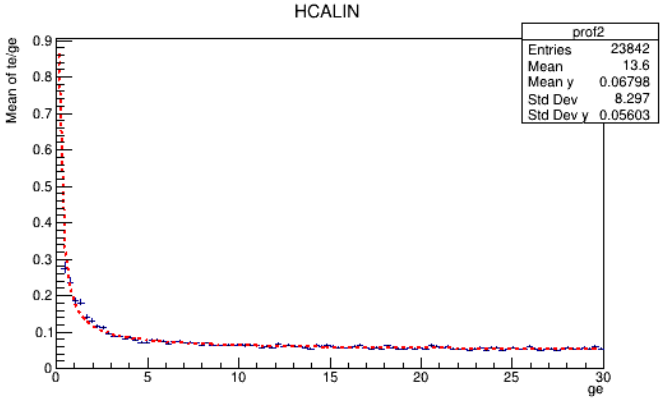


p0=0.11155;
p1=0.431151

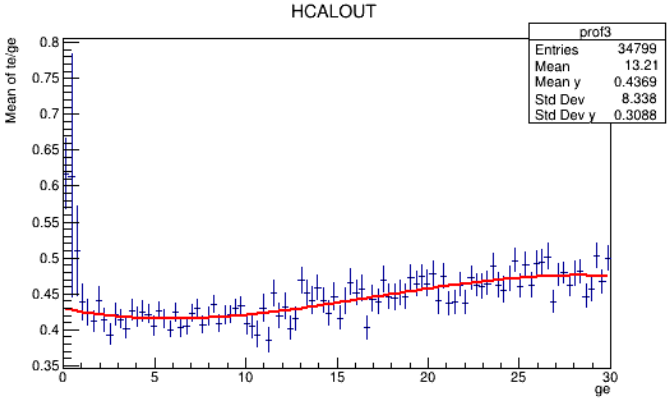
Tprofile plots:



(pol4 fit)



([0] + [1]/sqrt(x) +[2]/x)

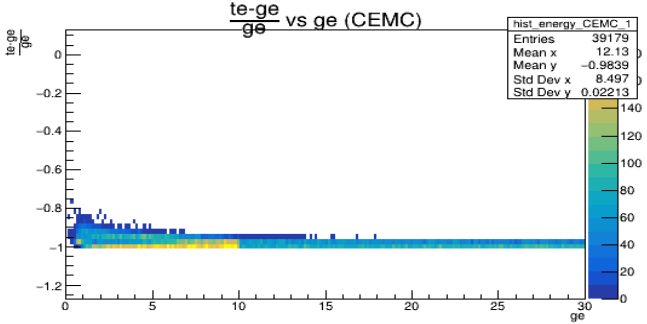


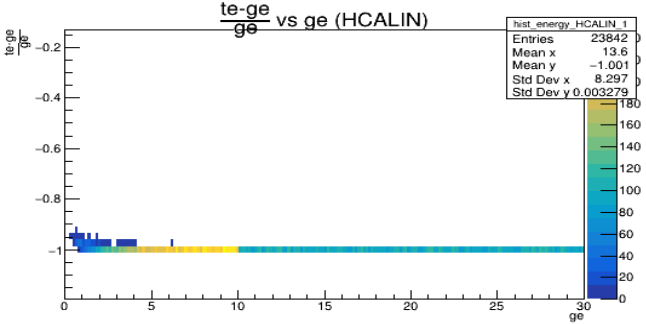
(pol3 fit)

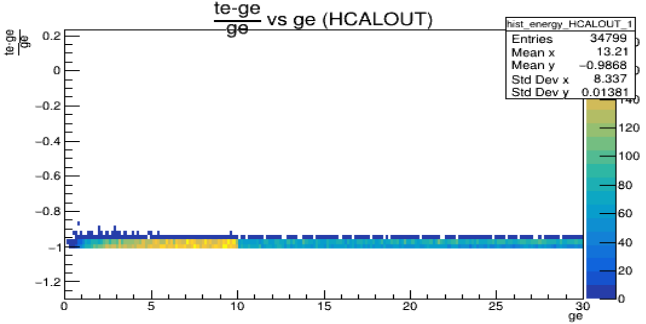
Next step: Normalization of these three fit functions by dividing them with their integral.
The normalized function is then **multiplied** with the tower energy of the respective calorimeter.

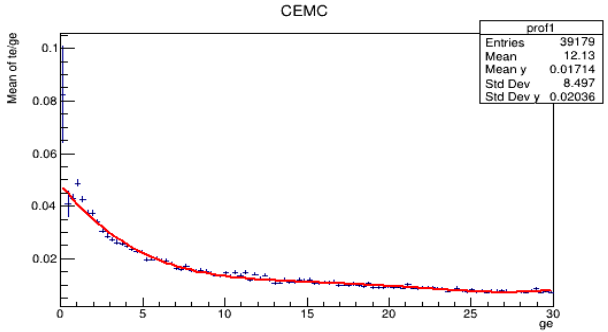
Shape correction with normalized fit functions: CEMC+HCALIN+HCALOUT

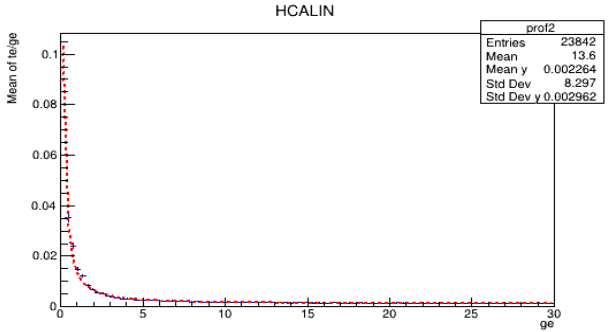
η = -1.1 to 1.1

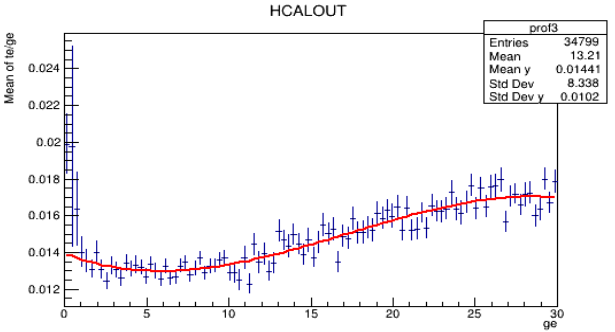


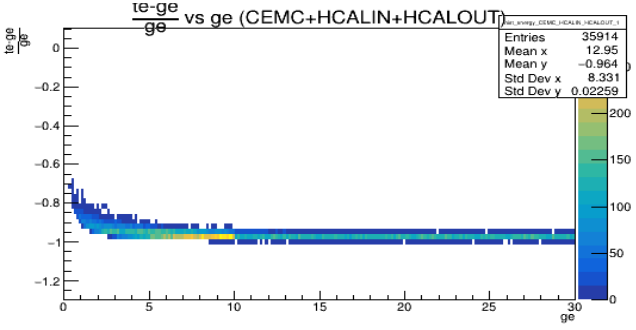


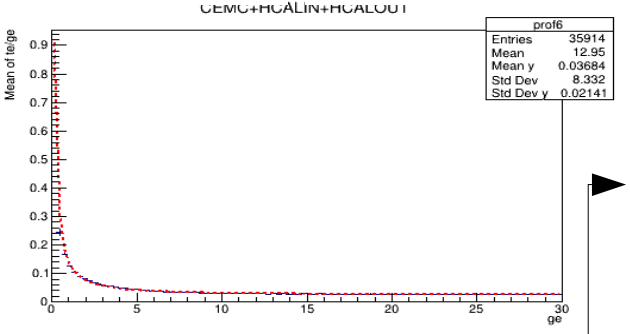












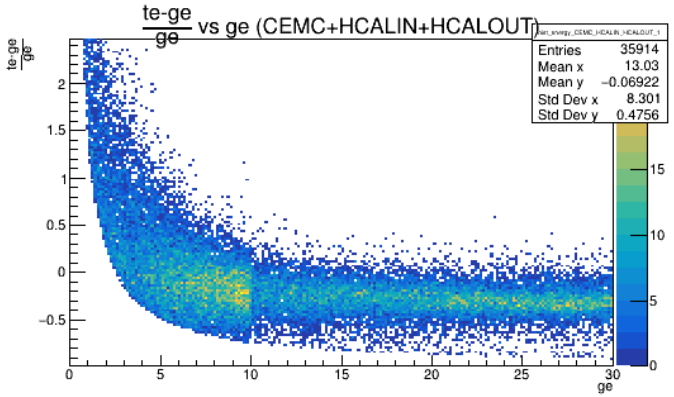
([0] + [1]/sqrt(x) +[2]/x)

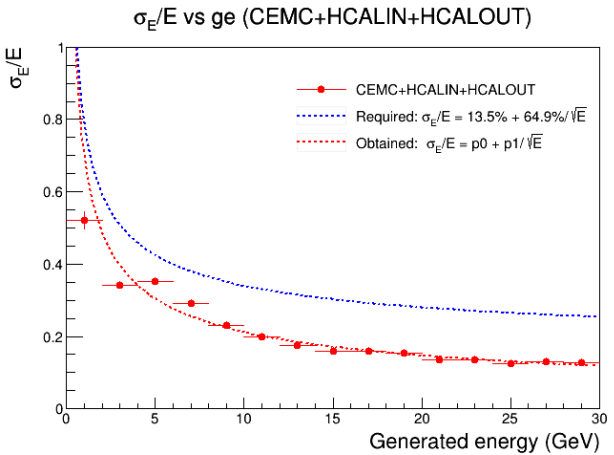
Next step: 1. The y-mean is used for calibration (te(CEMC+HCALIN+HCALOUT) / ymean)
2. The fit function obtained for CEMC+HCALIN+HCALOUT plot is used for calibration of the total tower energy (te(CEMC+HCALIN+HCALOUT) / fit func).

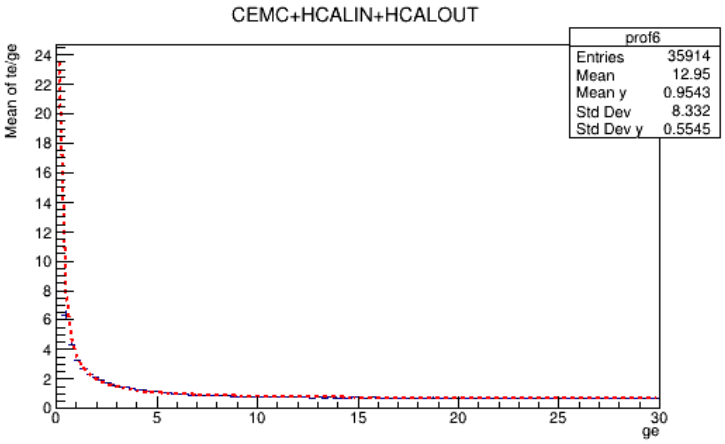
Recalibration: CEMC+HCALIN+HCALOUT

η = -1.1 to 1.1

Recalibration:- with y-mean

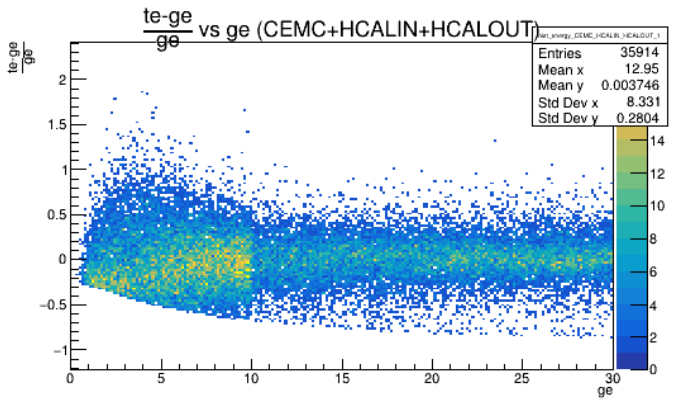


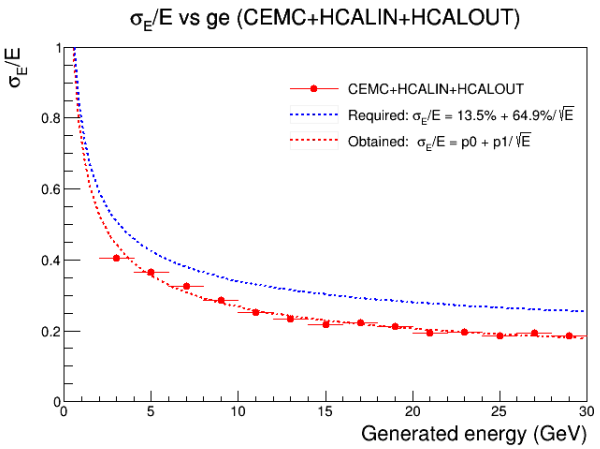


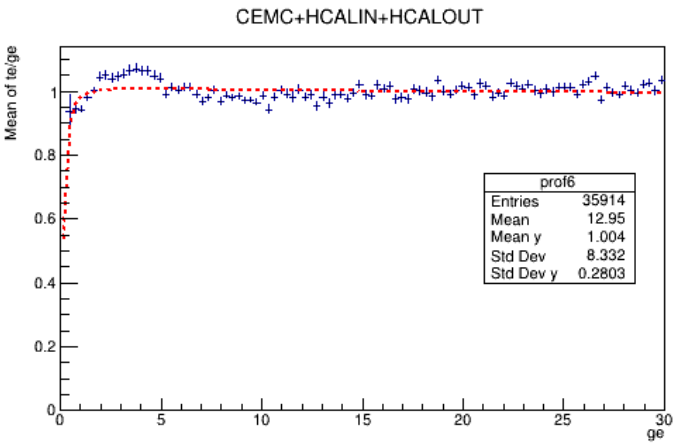


p0=-0.0108495; p1=0.706109

Recalibration:- with fit function





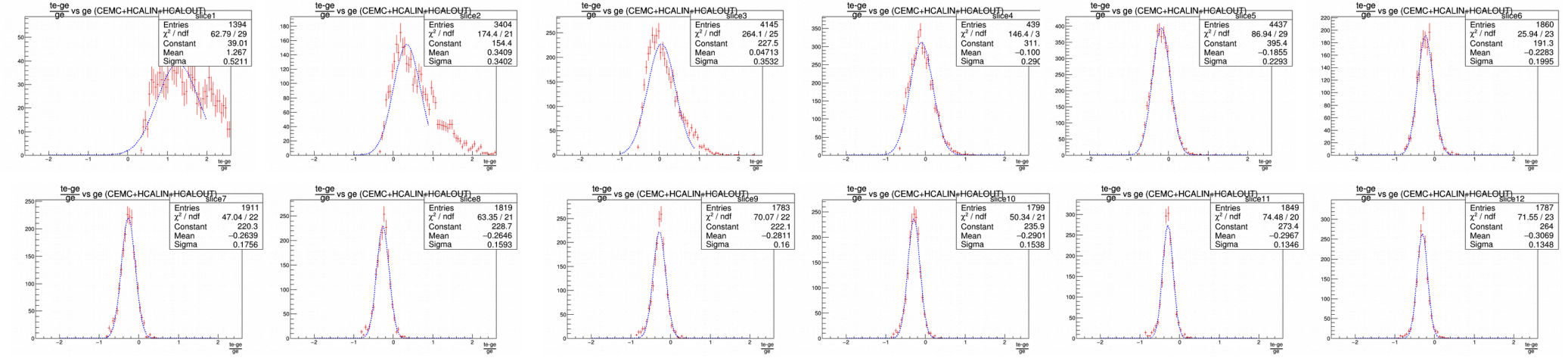


p0=0.0558756; p1=0.669669

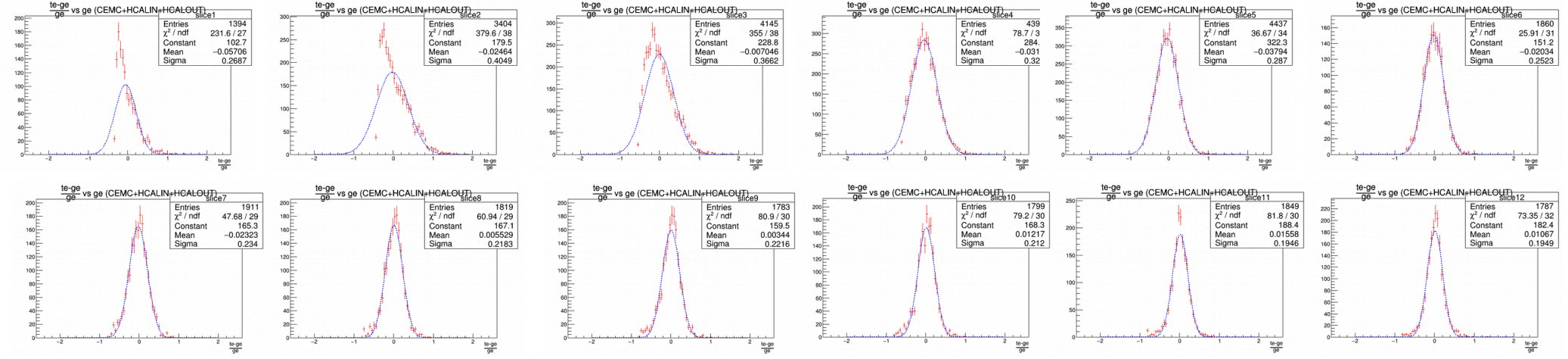
Gaussian Fits: CEMC+HCALIN+HCALOUT

η = -1.1 to 1.1

Recalibration:- with y-mean

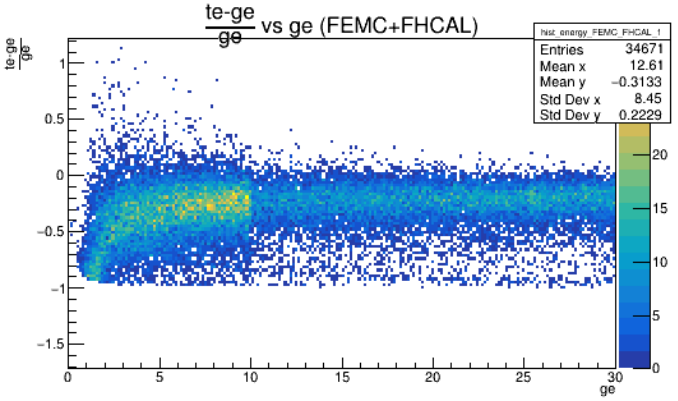


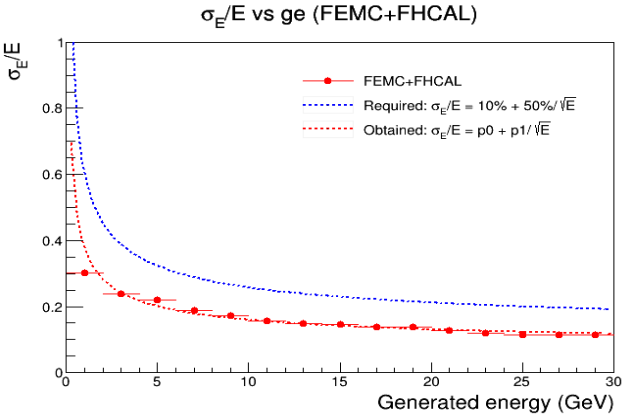
Recalibration:- with fit function



Before recalibration: FEMC+FHCAL

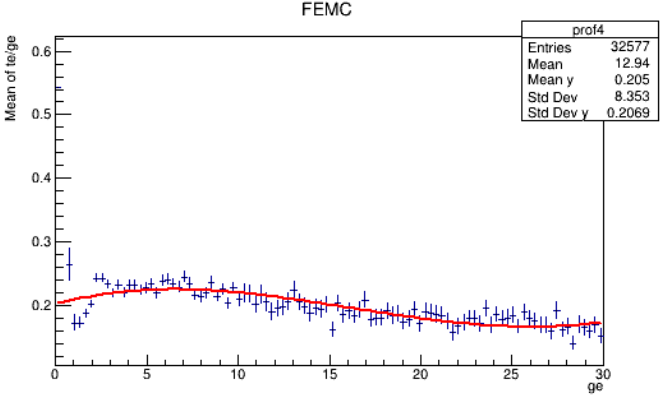
η = 1.3 to 3.3



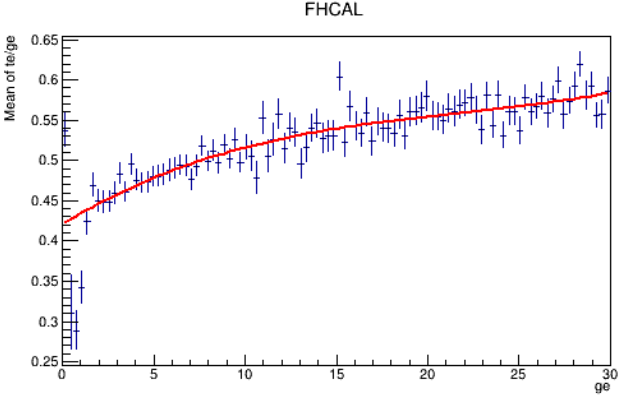


p0=0.0598577;
p1=0.316926

Tprofile plots:



(pol3 fit)

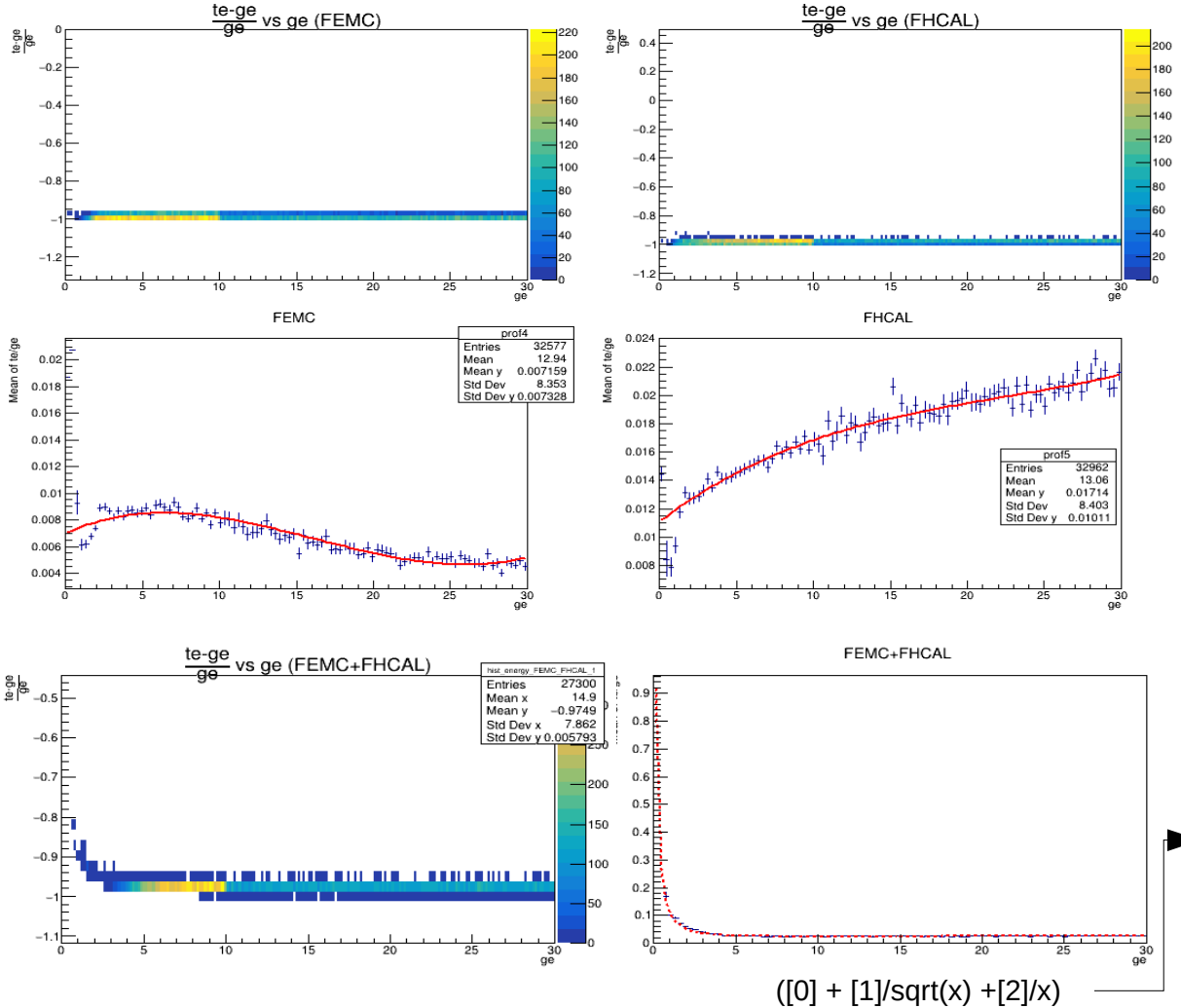


(pol3 fit)

Next step: Normalization of these two fit functions by dividing them with their integral.
The normalized function is then **multiplied** with the tower energy of the respective calorimeter.

Shape correction with normalized functions: FEMC+FHCAL

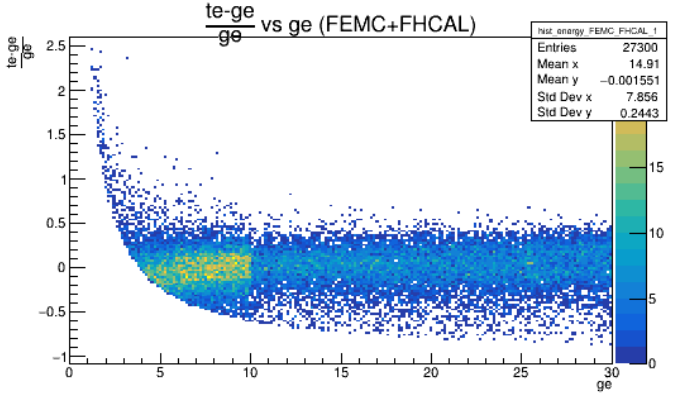
η = 1.3 to 3.3

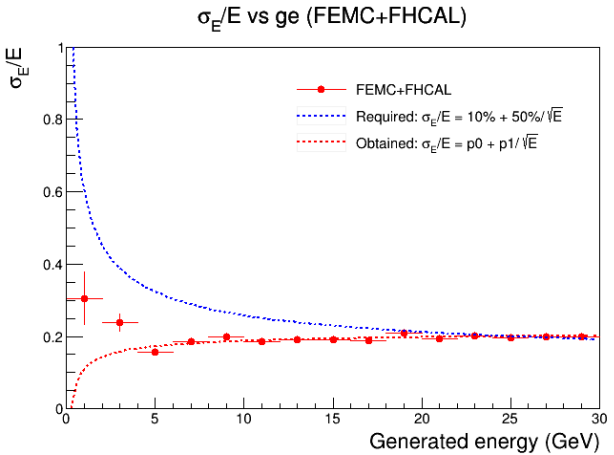


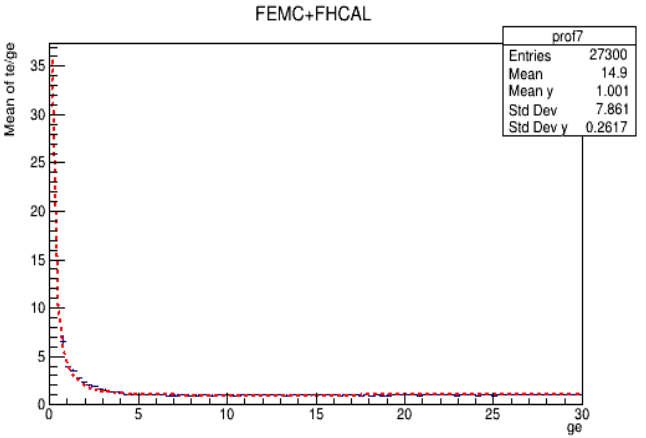
Next step: 1. The y-mean is used for calibration (te(FEMC+FHCAL)/ ymean)
2. The fit function obtained for FEMC+FHCAL plot is used for calibration of the total tower energy (te(FEMC+FHCAL)/ fit func).

Recalibration: FEMC+FHCAL
η = 1.3 to 3.3

Recalibration:- with y-mean

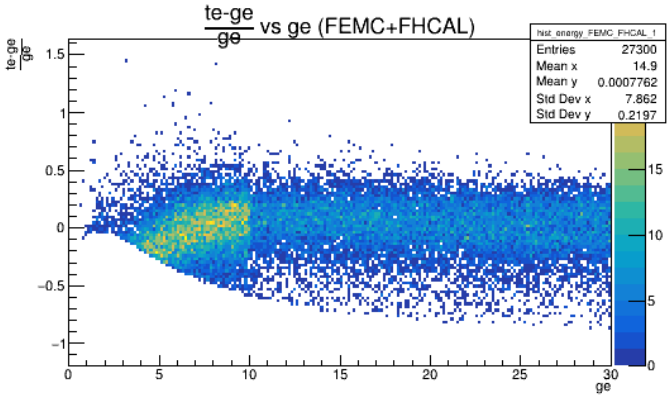


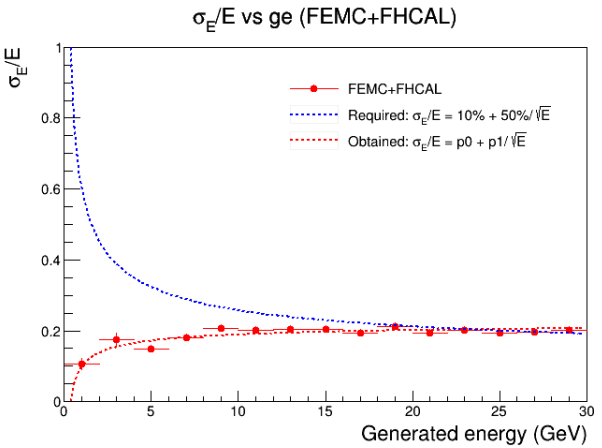


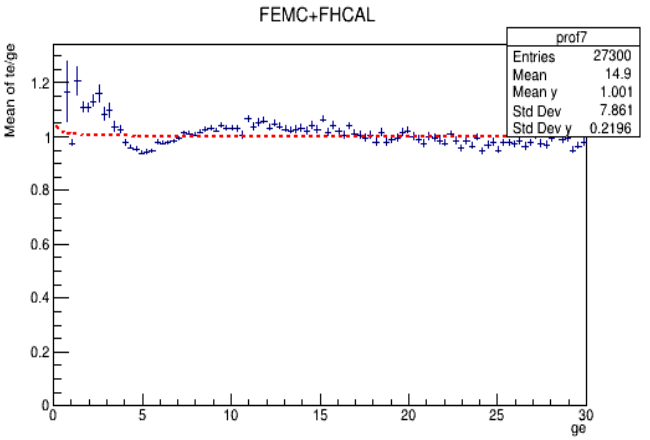


p0=0.222486; p1=-0.111601

Recalibration:- with fit function





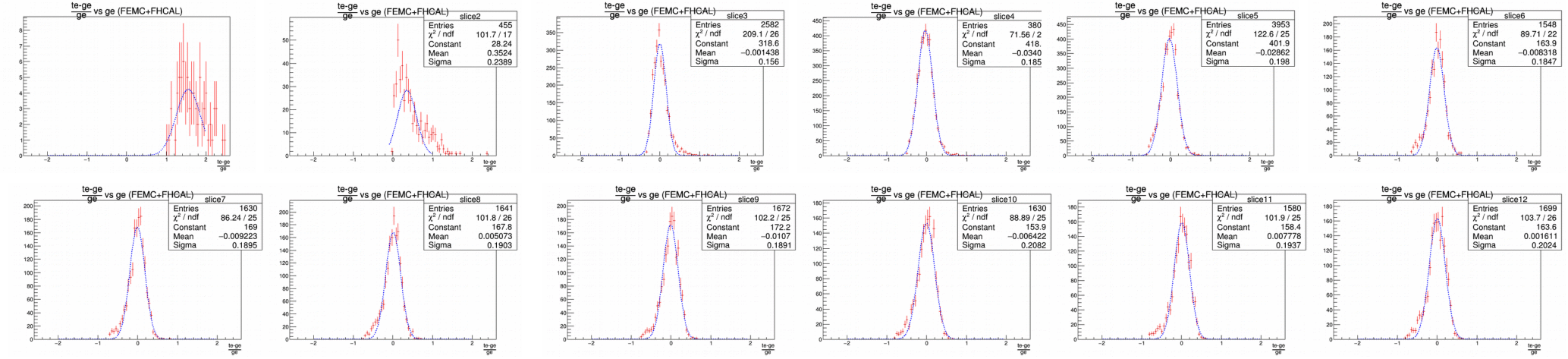


p0=0.230483; p1=-0.130824

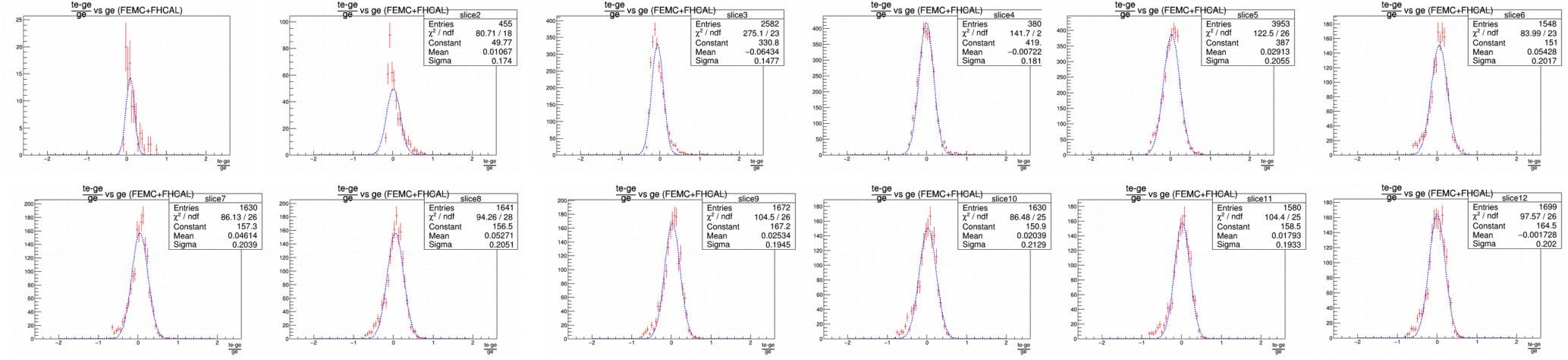
Gaussian Fits: FEMC+FHCAL

η = 1.3 to 3.3

Recalibration:- with y-mean



Recalibration:- with fit function



THE END